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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
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| 10/770,888 | 02/03/2004 | Paul Martin Schulte | NTS 0102 PUS | 1089 |
| 22045 | 7590 | 07/13/2005 | EXAMINER | |
| BROOKS KUSHMAN P.C. 1000 TOWN CENTER TWENTY-SECOND FLOOR SOUTHFIELD, MI 48075 | | | TALBOT, MICHAEL | |
| | | | ART UNIT | PAPER NUMBER |
| | | | 3722 | |

DATE MAILED: 07/13/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/770,888

Applicant(s)

SCHULTE, PAUL MARTIN

Examiner

Michael W. Talbot

Art Unit

3722

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 03 February 2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-29 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-29 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892).
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date 2.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

DETAILED ACTION

Specification

1. The disclosure is objected to because of the following informalities:

Refer to page 5, lines 21 and 22, the phrase "the length of the reamer 20 and the diameter d_b of the body 24 is dictated" should be changed to read --the length of the reamer 20 and the diameter d_b of the body 24 are dictated--.

Refer to page 7, lines 1 and 2, the phrase "The array of straight flutes and the array of helical flutes 42 is arranged" should be changed to read --The array of straight flutes and the array of helical flutes 42 are arranged--.

Appropriate correction is required.

Claim Objections

2. Claims 17 and 18 are objected to because of the following informalities:

Refer to claim 17, line 2 and claim 18, line 3, the character reference "the at least one primary flute" should be changed to read --the at least one first flute-- to remain consistent with claim 1 from which it depends therefrom.

Appropriate correction is required.

Claim Rejections - 35 USC § 102

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless --

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1-6,9,10,13,14,16-24 and 27-29 are rejected under 35 U.S.C. 102(b) as being anticipated by Yeo '316. Yeo '316 shows in Figure 1 a rotary cutting tool (10) having a shank (12) for rotation in a first hand direction (15), a cylindrical body extending axially from shank

Art Unit: 3722

having at least one first flute (28) with at least one first flute cutting edge (36) in a distal end (40) of the body, the body having at least one helical flute (16,18) formed therein at an angle relative to an axis of rotation that is greater than that of the at least one first flute (col. 2, lines 51-54 and col. 3, lines 10-13) and being formed in a second hand rotational direction opposite to the first hand directional rotation. Yeo '316 shows the at least one helical flute having at least one helical flute cutting edge (24,26) spaced radially apart from the at least one first flute cutting edge so that a leading portion of the cutting edges generally lie in a common radial plane. Yeo '316 shows the at least one first flute and first flute cutting edge being straight relative to the axis of rotation when the helix angle is approximately a 1 degree helix (col. 3, lines 10-13) and therefore equivalent to that defined by the Applicant in the specification (page 8, lines 15-24).

Regarding claim 4, Yeo '316 shows a longitudinal direction between the at least first flute cutting edge and the at least one helical flute cutting edge being less than 10 percent. Again based upon the relationship chosen between the helix angles of the first flute and helical cutting edges, a 10 percent or less relationship can be achieved (col. 3, lines 10-13).

Regarding claims 6,9 and 10, Yeo '316 shows a cylindrical margin (20,22,42), a longitudinal margin (42) generally aligned with the at least first flute, and a helical margin (20,22) generally aligned with the at least one helical flute for providing bearing support to the tool within the hole.

Regarding claims 13,17 and 18, Yeo '316 shows at least one primary relief surface (46) and at least one secondary relief surface (48) extending therefrom and formed along the at least one first flute cutting edge, and at least one relief surface (32,34) formed along the at least one helical flute cutting edge.

Regarding claims 14 and 16, Yeo '316 shows the at least one first flute cutting edge comprising a leading edge (50) inclined in relation to a radial plane and an end cutting edge (52)

Art Unit: 3722

formed at an intersection of the first flute cutting edge and the distal end of the body (col. 3, lines 3-8).

Regarding claims 19-24, Yeo '316 shows the at least one first flute comprising an array of first flutes (28, only 1 of 2 shown) and the at least one helical flute comprising an array of helical flutes (16,18) wherein the respective array has an angular spacing tolerance (as defined by the Applicant on page 9, lines 2-8) between sequential flutes that is equal to or less than four radial quadrants divided by twice the number of respective flutes in the array in order to vary the loads imparted on the workpiece and tool. The number for both the first flutes and helical flutes is 2, therefore the angular spacing tolerance for each is equal to $(360 / (2*2)) = 360 / 4 = 90$ degrees which should be equal to or less than half the angular distance between respective flutes (180 degrees), which results in $(1/2) * 180 \text{ degrees} = 90 \text{ degrees}$.

Claims 1-10,13 and 18-29 are rejected under 35 U.S.C. 102(b) as being anticipated by Serwa 2002/0090273. Serwa 2002/0090273 shows in Figures 1-3 a rotary cutting tool (10) having a shank (18) for rotation in a first hand direction (A), a cylindrical body extending axially from shank having at least one first flute (24) with at least one first flute cutting edge (20) in a distal end (16) of the body, the body having at least one helical flute (26) formed therein at an angle relative to an axis of rotation that is greater than that of the at least one first flute (page 3, paragraph [0025]) and being formed in a second hand rotational direction opposite to the first hand directional rotation. Serwa 2002/0090273 shows the at least one helical flute having at least one helical flute cutting edge (22) spaced radially apart from the at least one first flute cutting edge so that a leading portion of the cutting edges generally lie in a common radial plane. Serwa 2002/0090273 shows the at least one first flute and first flute cutting edge being parallel or substantially parallel to the axis of rotation (page 3, paragraph [0025]) and therefore equivalent to that defined by the Applicant in the specification (page 8, lines 15-24).

Regarding claim 4, Serwa 2002/0090273 shows a longitudinal direction between the at least first flute cutting edge and the at least one helical flute cutting edge being less than 10 percent. Again based upon the relationship chosen between the helix angles of the first flute and helical cutting edges, a 10 percent or less relationship can be achieved (page 3, paragraph [0025]).

Regarding claims 6,9 and 10, Serwa 2002/0090273 shows in Figures 2 and 3 a cylindrical margin (not indexed), a longitudinal margin (not indexed) generally aligned with the at least first flute, and a helical margin (not indexed) generally aligned with the at least one helical flute for providing bearing support to the tool within the hole.

Regarding claims 7 and 8, Serwa 2002/0090273 shows in Figure 3 a negative rank angle for the first flute cutting edge (not indexed) and the helical flute cutting edge (not indexed).

Regarding claims 13 and 17, Serwa 2002/0090273 shows at least one primary relief surface (36) formed along the at least one first flute cutting edge, and at least one relief surface (34) formed along the at least one helical flute cutting edge.

Regarding claims 19-24, Serwa 2002/0090273 shows the at least one first flute comprising an array of first flutes (24,24) and the at least one helical flute comprising an array of helical flutes (26,26) wherein the respective array has an angular spacing tolerance (as defined by the Applicant on page 9, lines 2-8) between sequential flutes that is equal to or less than four radial quadrants divided by twice the number of respective flutes in the array in order to vary the loads imparted on the workpiece and tool. The number for both the first flutes and helical flutes is 2, therefore the angular spacing tolerance for each is equal to $(360 / (2*2)) = 360 / 4 = 90$ degrees which should be equal to or less than half the angular distance between respective flutes (180 degrees), which results in $(1/2) * 180 \text{ degrees} = 90 \text{ degrees}$.

Art Unit: 3722

Regarding claims 25 and 26, Serwa 2002/0090273 shows the number of first flutes can be any number desired , such as 3 or 5 flutes (page 4, paragraph [0033]).

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claim 11 is rejected under 35 U.S.C. 103(a) as being unpatentable over Yeo '316 in view of Reynolds et al. '458. Yeo '316 lacks the presence of at least one gash to assist in the removal of debris from the at least one helical flute cutting edge. Reynolds et al. '458 shows in Figures 1 and 2 a primary gash face (8) and a secondary gash face (10) serving the purpose of debris removal (col. 2, lines 32-44) from the helical flutes (5) at the body distal end (9). In view of this teaching of Reynolds et al. '458, it would have been obvious to include one or more gash faces shown by Reynolds et al. '458 to the rotary tool of Yeo '316 to facilitate debris removal so the tool could be operated at higher speeds with reduced wear, resulting in extended tool life.

Claim 12 is rejected under 35 U.S.C. 103(a) as being unpatentable over Yeo '316 in view of Magill et al. '712. Yeo '316 lacks the presence of a coolant channel for conveying coolant fluid to the cutting edges. Magill et al. '712 shows in Figure 5 a coolant passage (44) for conducting coolant to the cutting edges and the associated surface of the workpiece. In view of this teaching of Magill et al. '712, it would have been obvious to include a coolant passage shown by Magill et al. '712 to the rotary tool of Yeo '316 to provide cooling of the blades resulting in extended tool life.

Claim 15 is rejected under 35 U.S.C. 103(a) as being unpatentable over Yeo '316 in view of Miller '487. Yeo '316 lacks the presence of a pilot tip extending from the distal end.

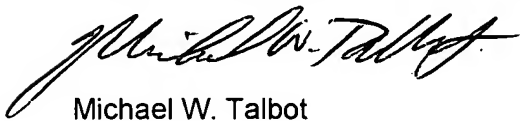
Art Unit: 3722

Miller '487 shows in Figure 1 a pilot tip (21) extending from the body distal end (18). In view of this teaching of Miller '487, it would have been obvious to include a pilot tip shown by Miller '487 to provide bearing support to the rotary tool within the hole being formed.


5. Any inquiry concerning the content of this communication from the examiner should be directed to Michael W. Talbot, whose telephone number is 571-272-4481. The examiner's office hours are typically 8:30am until 5:00pm, Monday through Friday. The examiner's supervisor, Mr. Boyer D. Ashley, may be reached at 571-272-4502.

In order to reduce pendency and avoid potential delays, group 3720 is encouraging FAXing of responses to Office Actions directly into the Group at FAX number 703-872-9306. This practice may be used for filling papers not requiring a fee. It may also be used for filing papers, which require a fee, by applicants who authorize charges to a USPTO deposit account.

Please identify Examiner Michael W. Talbot of Art Unit 3722 at the top of your cover sheet.



Michael W. Talbot
Examiner
Art Unit 3722



BOYER D. ASHLEY
PRIMARY EXAMINER